

CRYSTAL CHEMICAL COMPANY TEXAS

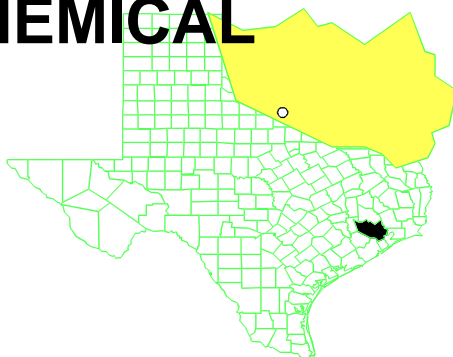
EPA ID# TXD990707010

EPA REGION 6

Congressional District 22

Harris County

Updated: 7/17/97



Site Description

- Location:**
- 3502 Rogerdale Road, near Alief in Houston, Harris County, Texas.
 - Residential and light industry area.
- Population:**
- Approximately 20,000 people live within a one-mile radius of the site.
- Setting:**
- The nearest residence is 2500 feet.
 - The nearest drinking water well is 300 feet.
 - 20 water wells exist within one-mile radius.
 - The site covers approximately 5 acres.
- Hydrogeology:**
- Soils at the site are mostly silty clay and sandy clay (poorly drained).
 - The 35-foot sand aquifer is contaminated with less than 600 parts per million (ppm) of arsenic.
 - The 35-foot sand appears to be confined from the lower aquifers (100-foot sand) by a 10-foot clay zone with a migration rate of 0.1 ft/year.
 - Drinking water supply wells completed in the Chicot Aquifer.
 - The site is located within the 100-year flood plain.

Wastes and Volumes

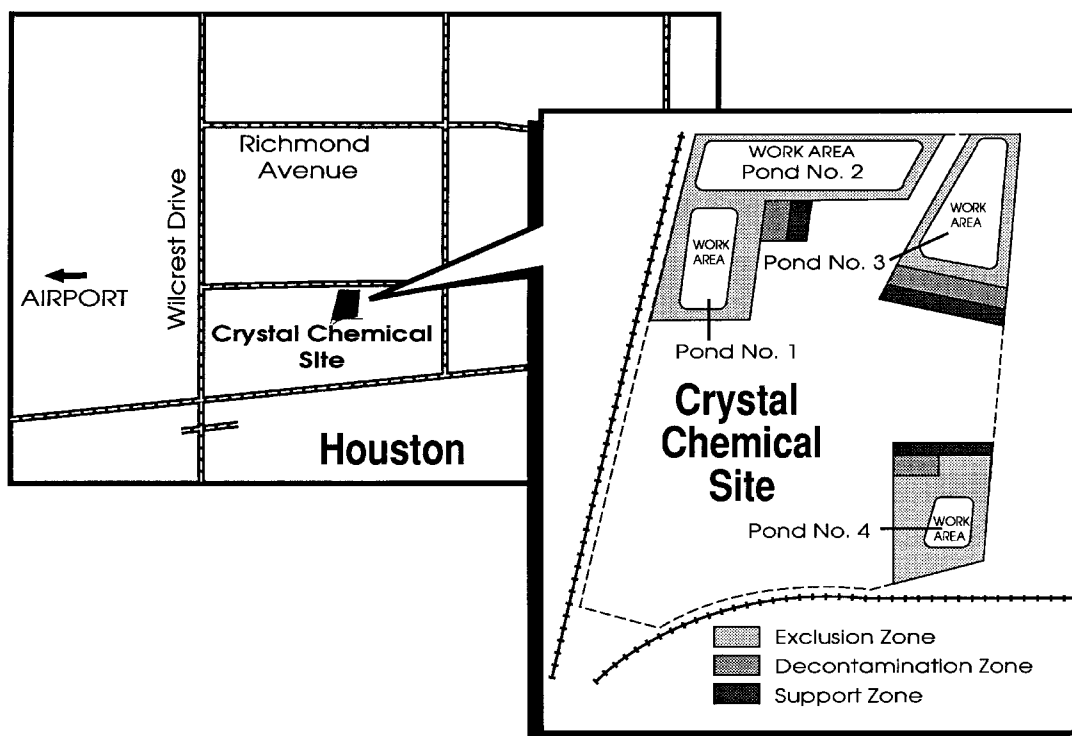
- The principal pollutant at the Crystal Chemical site is arsenic.
- The on-site subsurface (4 ft.) concentration is high, at approximately 27,000 ppm.
- The ground water (35-foot sand) arsenic concentration is less than 600 ppm.
- 3 on-site waste ponds, also highly contaminated, contain approximately 16,500 cu. yds.
- The total site quantity is approximately 156,000 cubic yards of soil, and 3 million gallons of water.
- The approximate volume of contaminated soils off-site is 25,000 cubic yards.

Site Assessment and Ranking

NPL LISTING HISTORY

Site HRS Score: 60.90
Proposed Date: 7/23/82
Final Date: 9/08/83
NPL Update: No. 1

Site Map and Diagram



The Remediation Process

Site History:

- The Crystal Chemical site was an active herbicide plant from 1968 until 1981, when bankruptcy was declared.
- From September 1981 through February 1983, EPA de-watered the site, filled in contaminated ponds, temporarily capped most of the plant site with 6 inches of clay, and added top soil and seed.
- Hurricane damage to the site resulted in a restart of work. Restart actions included repairing the fence, removal of contaminated liquids from two buildings, capping building floor, and installation of gravel berms.
- In September/October 1983 and August through October 1988, EPA made repairs to the clay cap and site fence.
- Removal actions by EPA resulted in 400 cubic yards of soils and 2 million gallons of contaminated water being removed from this site.
- The Remedial Investigation (RI) was completed in January 1984
- The Feasibility Study (FS) was completed in June 1984, with an Addendum Study completed in December 1984, and a Supplemental FS was completed in September 1990.
- From October 1990 through September 1991, the Potentially Responsible Party (PRP), removed additional contaminated soils from the Westpark Drive easement and made repairs to the cap and the Harris County Flood Control Ditch.

Health Considerations:

- Raw and finished materials from the manufacturer of arsenic-based pesticides were spread on surface soils and have leached into the ground.
- Potential chronic human exposure risks include the risk of skin and lung cancer from direct contact with, and ingestion of, contaminated soils and ground water, and inhalation of contaminated dust.

Other Environmental Risks:

- Shallow ground water is discharging into a Harris County flood control ditch, and the shallow ground water contamination has migrated north and south beyond the site boundary.

Record of Decision

Signed: September 27, 1990
Amended: June 16, 1992

- The remedy selected in 1990 was amended to select a new remedy for the soil contamination. The original remedy called for the use of an innovative technology, in situ vitrification, but the technology was withdrawn from the commercial market by the vendor. In situ vitrification is a process which uses electricity to generate heat which will melt the contaminated soil and permanently bonds the soil and contaminants into a glass like material as it cools.

Ground Water:

- Extraction of arsenic-contaminated ground water.
- Treatment of extracted water to remove arsenic through an ion exchange process where contaminants are removed from water through the exchange of nontoxic materials (ions) from an ion exchange material.
- The toxic materials are retained in the exchanged material, which is disposed.
- Treated water will be discharged to either a publicly-owned treatment works (POTW), the flood control ditch, or will be re-injected into the subsurface at the site.

Soil Treatment:

- Excavation of all arsenic-contaminated soils from the off-site areas down to 30 ppm.
- Consolidation of these excavated soils onsite.
- Construction of a multi-layer cap over the entire site to contain the wastes.

Other Remedies Considered

Reason Not Chosen

-----SOIL-----

- | | |
|---|----------------------------------|
| 1. "No Action" | Did not meet remedial objectives |
| 2. Limited Action | Did not meet remedial objectives |
| 2. Excavation and Off-Site Disposal | Difficult to implement |
| 3. Full or Partial In-Situ Vitrification | Technology not available |
| 4. Full or Partial Solidification/Stabilization | Poor treatment success |
| 5. Full or Partial Soil Washing | Difficult to implement |

-----GROUND WATER-----

- | | |
|---|----------------------------------|
| 1. "No Action" | Did not meet remedial objectives |
| 2. Limited Action | Did not meet remedial objectives |
| 3. Slurry Wall Containment | Did not meet remedial objectives |
| 4. Extraction and Discharge to POTW (not treated) | Did not meet remedial objectives |

Community Involvement

- Community Involvement Plan: Developed 8/89 , revised 2/91
- Open houses and workshops: 4/90, 6/90, 2/92, 10/94
- Original Proposed Plan Fact Sheet and Public Meeting: 6/90.
- Original ROD Fact Sheet: 10/90
- Milestone Fact Sheets: 4/85, 11/87 (by PRPs), 1/91, 9/94, by PRPs
- EPA Amended Proposed Plan and Public Meeting held : 2/92
- Proposed Ground Water Explanation of Significant Differences (ESD) Fact Sheet: 7/96
- Citizens on site mailing list: 183
- Constituency Interest:
 - Community concerns about site aesthetics after the remedy is completed.
 - Political inquiries regarding the length of time required to effect the cleanup.
- Outreach activities with PRPs completed Fall 1994
- Site Repository: Jungman Public Library, 5830 Westheimer Road, Houston, TX 77057

Technical Assistance Grant

- Availability Notice: 4/89
- Letters of Intent Received: 1) LIFT Endowment, Inc. - 2/8/90 (later withdrawn) 2) Westchase Business Council - 4/2/90
- Final Application Received: 6/11/91
- Grant Award: 8/16/91
- Current Status: The group is finalizing procurement of their Technical Advisor (was delayed during ROD amendment)
- Grant being reviewed for possible annulment due to lack of activity, 4/95

Fiscal and Program Management

- **Remedial Project Manager (EPA):** Chris Villarreal, 214-665-6758, Mail Code: 6SF-AP
- **State Contact:** (TNRCC) Trey Collins, 512/239-2030, Mail Code 144
- **Community Involvement Coordinator (EPA):** Donn Walters, 214-665-6483, Mail Code: 6SF-P
- **Attorney (EPA):** Ann Foster, 214-665-2169, Mail Code: 6SF-DL
- **State Coordinator (EPA):** Shirley Workman, 214-665-8522, Mail Code: 6SF-AT
- **Prime Contractor:** Industrial Compliance (for PRPs)

Cost Recovery: PRP Lead (Enforcement)

- PRPs Identified: 13
- Viable PRP: Union Pacific Railroad Company (formerly Southern Pacific Transportation Company)
- PRPs committed to do the supplemental FS in a Consent Order signed April 28, 1987.
- An Administrative Order was issued in May 1991 to PRPs regarding excavation of contaminated soils from the Westpark Drive easement.
- An Administrative Order was issued in March 1992 for the Ground Water RD.
- An Unilateral Administrative Order was issued in September 1992 for the Ground Water RA, and the soil RD/RA.

Present Status and Issues

- Emergency actions to remove or cap contaminated soils and liquid wastes, as well as repair and upkeep activities, have reduced the actual exposure potential and the migration of contaminated ground water at the Crystal Chemical Company site, making it safer while cleanup continues.
- During the development of the remedial design for the ground water remedy, it was determined that it is technically impracticable to implement the ground water remedy for a large portion of the contaminated ground water plume due to hydrogeologic factors and contaminant related factors. Where technically practicable, contaminated ground water is currently being extracted and treated on-site. A proposed Explanation of Significant Differences (ESD) identifying the use of a slurry wall was issued for public comment. The purposed slurry wall would, once constructed, will contribute to the long-term management of contaminant migration by limiting the further contamination of ground water. The slurry wall would also permit restoration of the portion of the contaminated plume that would lie outside the containment area. During the formal public comment period for the ESD, the only comments received were from an adjacent landowner. The EPA will be issuing a responsiveness summary which will address these comments.
- The remedial design for the soil remedy was finalized in January 1995. Remedial Action (construction) was completed in 1996.

Benefits

- Removal actions by EPA resulted in 400 cubic yards of soils and almost 2 million gallons of contaminated water being removed from this site.
- Site cleanup will reduce health risks for over 20,000 residents living within one mile of the site.